CLAIMS:

1. An optical arrangement for interacting with a radiation beam (7), the optical arrangement comprising an optical system and a compensator, the compensator including a first optical element (NPS1), the first optical element having a phase structure comprising stepped annular areas (51, 52, 53) forming a non-periodic pattern of optical paths of different lengths, the compensator being arranged to generate:

- a first wavefront deviation introduced by the variation of a first parameter during interaction of the radiation beam (7) with the compensator, the first wavefront deviation being arranged to counteract a wavefront deviation introduced by the variation of the first parameter during interaction of the radiation beam (7) with the optical system; and
- a second wavefront deviation introduced by the variation of a second, different, parameter during interaction of the radiation beam (7) with the compensator;

characterised in that the compensator further includes a second optical element (NPS2) having a phase structure comprising stepped annular areas (54, 55, 56) forming a non-periodic pattern of optical paths of different lengths, the second optical element being arranged to reduce said second wavefront deviation.

2. An optical arrangement according to claim 1, wherein the first optical element (NPS1) and the second optical element (NPS2) are formed from different materials.

3. An optical arrangement according to claim 1 or 2, wherein the annular areas of the first optical element (NPS1) are stepped by a step height of h_j and the annular areas of the second optical element (NPS2) are stepped by a step height of b_j and wherein the first optical element (NPS1) is arranged such that, for each said annular area, the step height h_j is substantially equal to:

$$h_j = m_j \frac{\lambda}{n_1 - 1}$$

where m_j is an integer, λ the wavelength and n_1 is the refractive index the material from which the first optical element (NPS1) is made, and

wherein the second optical element (NPS2) is arranged such that, for each said annular area, the step height b_j is substantially equal to:

$$b_j = q_j \frac{\lambda}{n_2 - 1}$$

where q_j is an integer, λ the wavelength and n_2 the refractive index of the material of which the second optical element (NPS1) is made.

4. An optical arrangement according to claim 3, wherein the first optical element and the second optical element have correspondingly arranged annular areas, and wherein the step heights h_j, b_j are interrelated.

5. An optical arrangement according to claim 4, wherein the step heights h_j, b_j are related by way of a substantially constant parameter K, the value of the constant parameter K depending on the compensating function of the respective optical elements.

6. An optical arrangement according to claim 5, wherein:

$$K = \frac{m_j}{q_j}$$

7. An optical arrangement according to claim 5 or 6, wherein:

$$K \approx -\frac{\frac{1}{\lambda} - \frac{\frac{dn_2}{d\lambda}}{n_2 - 1}}{\frac{1}{\lambda} - \frac{\frac{dn_1}{d\lambda}}{n_1 - 1}},$$

and wherein the second parameter is a wavelength of the radiation beam (7).

8. An optical arrangement according to claim 5 or 6, wherein:

$$K \approx -\frac{(n_2 - 1)\alpha_2 + \frac{dn_2}{dT}}{(n_1 - 1)\alpha_1 + \frac{dn_1}{dT}}$$

where α_1 and α_2 are the thermal expansion coefficients, and $\frac{dn_1}{dT}$ and $\frac{dn_2}{dT}$ are the temperature coefficients of refractive index, of the materials from which the first and second optical elements are formed,
and wherein the second parameter is a temperature of the optical arrangement.

9. An optical arrangement according to claim 5 or 6, wherein:

$$K \approx -\frac{n_1}{n_2},$$

and wherein the second parameter is an angle of incidence of the radiation beam (7).

10. An optical arrangement according to claim 5 or 6, wherein:

$$K \approx -\frac{(n_1 - 1)\frac{dn_2}{dp}}{(n_2 - 1)\frac{dn_1}{dp}},$$

where $\frac{dn_1}{dp}$ and $\frac{dn_2}{dp}$ are the polarization coefficients of refractive index of the materials from which the first and second optical elements are formed,
and wherein the second parameter is a polarization of the radiation beam (7).

11. An optical scanning device comprising an optical arrangement according to any preceding claim, the device being arranged for scanning an optical record carrier having an information layer (2) using a radiation source (9).